

Remarks

Claims 1-29 were originally filed. Claims 1-13 and 25-29 have been withdrawn from consideration. New claims 30-37 have been added without introducing new matter. As a result, claims 14-24 and 30-37 remain pending for examination.

For at least the reasons listed below, claims 14-24 and 30-37 are in condition for allowance without further amendment.

Election/Restriction Requirement

Restriction of claims 1-13 and 25-29 has been indicated. Specifically, claims 1-29 have been restricted into the invention of Group I (claims 1-13 and 25-29); drawn to a method of manufacture, and into the invention of Group II (claims 14-24); drawn to a product. Election of a single disclosed species for prosecution on the merits has further been required.

Applicants confirm the provisional election, with traverse, to prosecute the invention of Group II, claims 14-24. Claims 1-13 and 25-29 are withdrawn from consideration, without prejudice or disclaimer, as being drawn to a non-elected invention. For examination purposes only, Applicants confirm election of silicon carbide species.

Applicants respectfully traverse the Election/Restriction requirement because the search and examination of all originally presented claims can be made without undue burden. Moreover, Applicants traverse the characterization that no claims are generic. Independent claim 14 is directed to an article comprising, generically, a ceramic material; the ceramic material can be silicon carbide, silicon nitride, or aluminum nitride.

Thus, Applicants respectfully request reconsideration of the requirement as well as examination of all claims.

Rejection under 35 U.S.C. §112

The Examiner has rejected claims 14-24 under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants respectfully disagree for the reasons stated below.

Applicants disagree that dependent claim 16 is broader than independent claim 14. Independent claim 14 utilizes the open-ended transition “comprising” with respect to, inter alia, the recited phrase “an active impurity component.” Thus, independent claim 14 is not, as Examiner suggests, limited to only one active impurity component. Indeed, the article claimed

independent claim 14 could further include unrecited components such as one or more inactive impurity components.

Further, one skilled in the art would understand the phrases “active impurity” and “inert impurity” in view of the specification. Active impurity and inert impurity are explicitly defined in the specification as originally filed including, for example, at page 15, lines 16-31, which notes that the phrases “active impurity component” and “active impurity” refer to any species that can be transferred from the ceramic article into a substrate or working article before, during or after processing of the substrate or article when such substrate or working article comes in contact or in proximity with the ceramic article. The phrase “active impurity component” contrasts with the phrase “inert impurity component.” The latter refers to any species that may be present in the ceramic matrix that does not affect or contaminate a substrate or working article. For example, during semiconductor wafer processing, an inert impurity component can be any species, such as yttrium, that may migrate from the ceramic article but does not affect the utility or pertinent operational properties of the semiconductor wafer.

For at least the foregoing reasons, independent claim 14, along with dependent claims 15-24, are not indefinite.

Reconsideration and withdrawal of the rejection of claims 14-24 under 35 U.S.C. §112, second paragraph, is therefore respectfully requested because the recited phrases do render independent claim 14 indefinite.

#### Rejections Under 35 U.S.C. §§102/103

The Examiner has rejected claims 14-24 under 35 U.S.C. §102(b) as being anticipated by, or in the alternative under 35 U.S.C. §103(a) as being obvious over, the teaching of Pickering et al. in EP 0582444 (EP '444).

Applicants disagree that claims 14-24 are anticipated by the teaching of EP '444. EP '444 teaches a method and apparatus for making high purity, monolithic, free-standing silicon carbide. To that end, EP '444 utilizes chemical vapor deposition (CVD) techniques. As illustrated in at least Table 1 of EP '444, implicitly disclosed is a method of making a dense silicon carbide. The Examiner asserts that no porosity is provided in the reference. However, no pore size is disclosed in EP '444 because no porous substance can be fabricated by CVD techniques.

In contrast to the dense silicon carbide of EP '444, the invention embodied in independent claim 14 is directed to a ceramic article having a pore size of at least about 15  $\mu\text{m}$ . Inherent in the recitation of a minimum pore size is the disclosure of a porous material. There is no anticipation of independent claim 14 because the cited reference fails to disclose a porous material having pores with a pore size of at least about 15  $\mu\text{m}$ . EP '444 thus fails to teach each and every limitation recited in independent claim 14.

Dependent claims 15-24, which recite further aspects of the invention, depend directly or indirectly on independent claim 14. These dependent claims are likewise novel over the teaching of the cited reference for at least the same reasons discussed.

As such, withdrawal of the rejection of claims 14-24 as being anticipated by the teaching of EP '444 is respectfully requested.

Applicants further disagree that claims 14-24 are obvious over the teaching of EP '444. There is no prima facie case of obviousness because the reference does not provide any teaching, suggestion, or motivation to modify the teaching of the reference and produce a porous substrate. Specifically, no teaching has been identified pertinent to any suggestion to modify the referenced CVD technique that would provide a ceramic material having a pore size of at least about 15  $\mu\text{m}$  as recited in independent claim 14. Therefore, the rejection is improper. Further, even if there were a suggestion to modify, which Applicants do not concede, any proposed modification would not result in the invention as claimed in independent claim 14. Applicants rebut that there is any teaching or suggestion as to how to make a porous structure. Chemical vapor deposition is a chemical process for depositing various materials. In this process, the substrate is exposed to one or more volatile precursors, which react and/or decompose on the substrate surface to produce the deposited material. It is known in the art that chemical vapor deposition must produce dense, non-porous structures. Thus, even if the disclosed CVD techniques were utilized, the fabricated ceramic article would not have pores with a pore size of at least about 15  $\mu\text{m}$ . Independent claim 14 is therefore inventive and not obvious over the teaching of the cited reference.

Dependent claims 15-24, which depend, ultimately from independent claim 14, are likewise inventive and non-obvious over the teaching of EP '444 for at least the same reasons.

For at least the foregoing reasons, reconsideration and withdrawal of the rejection of claims 14-24 as being obvious over the teaching of EP '444 is respectfully requested.

The Examiner has also rejected claims 14-24 under 35 U.S.C. §102(b) as being anticipated by the teaching of Sakashita et al. in GB 2130192 (GB '192).

Applicants disagree that claims 14-24 are anticipated by GB '192.

GB '192 teaches a silicon/silicon-carbide article for use in semiconductor manufacture. Specifically, GB '192 teaches producing a silicon-coated silicon carbide article by granulating silicon carbide with carbon-based compounds; at least partially sintering the mixture to produce a carbon/silicon carbide ceramic matrix green body; and introducing melted silicon thereon to fill the pores and coat the surfaces thereof. The resultant article is comprised of a silicon carbide ceramic coated with non-porous silicon. Thus, the cited reference cannot teach a ceramic material having a pore size of at least about 15  $\mu\text{m}$ . The Examiner states that GB '192 fail to teach any pore size. Applicants submit that the reason that no pore size is disclosed in GB '192 is that there is in fact a great amount of excess carbon in the silicon carbide and that the pores originally existing in the molded body of page 3, lines 3-6 of GB '192 would have been significantly diminished by the addition of the melted silicon. Again, the reference teaches a dense silicon-coated silicon carbide ceramic article.

In contrast to the dense silicon carbide of GB '192, the invention embodied in independent claim 14 is directed to a ceramic article having a pore size of at least about 15  $\mu\text{m}$ . The teaching of GB '192, therefore, fails to anticipate independent claim 14 because it fails to disclose each and every limitation recited therein.

As noted above, dependent claims 15-24 are directed to further aspects of the invention. These dependent claims are likewise novel over the teaching of GB '192 for at least the same reasons discussed above.

The Examiner has also rejected claims 14-24 under 35 U.S.C. §103(a) as being obvious over the teaching of GB '192.

Applicants also disagree that claims 14-24 are obvious over the teaching of GB '192. There is no motivation to modify, and even if there were, the reference fails to teach at least one limitation of the claimed invention. Indeed, the rejection is improper because no prima facie case of obviousness has been established because the reference does not provide any teaching, suggestion, or motivation to produce an article comprising a ceramic material having a pore size of at least about 15  $\mu\text{m}$  as recited in independent claim 14. Further, even if there were a

suggestion to modify, which Applicants do not concede, any proposed modification would not result in the invention as claimed.

In fact, GB '192 teaches away from any such motivation to modify because it explicitly teaches filling the pores of the molded body with the melted silicon. (See page 3 of GB '192). Further, as noted above, the reference fails to provide any teaching directed to a pore size of at least about 15  $\mu\text{m}$  as embodied in independent claim 14 and any modification thereto would directly contradict the express teaching of the reference because the reference teaches coating the silicon carbide based article to reduce impurity vaporization. A porous structure would thus run contrary to such express objectives. Thus any alleged prima facie case of obviousness is further rebutted. Applicants submit, therefore that GB '192 fails to render obvious independent claim 14.

Likewise, dependent claims 15-24 are not obvious over the teaching of GB '192 for at least the same reasons.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 14-25 under 35 U.S.C. §§ 102 and 103.

#### Newly Added Claims

Newly added claims 30-32 are directed to an article comprising a ceramic material selected from the group consisting of silicon carbide, silicon nitride, and aluminum oxide, the ceramic material having pores interconnected to form a network and an active impurity component at a concentration of less than about 400 ppm. New claims 33-37 are directed to an article comprising a recrystallized silicon carbide member having a network of pores that have a pore size of at least about 5  $\mu\text{m}$ . No new matter has been introduced with these new claims. Support for these claims can be found throughout the application, including the claims, as originally filed.

Further, these claims are novel and not obvious over the teachings of EP '444 and GB '192 for at least the same reasons discussed above.

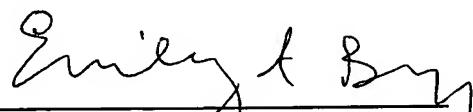
#### Conclusion

In view of the foregoing Amendments and Remarks, this application is in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes that the

application is not in condition for allowance, the Examiner is requested to call Applicants' attorney at the telephone number listed below.

If this Response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 50/2762.

Respectfully submitted,  
Narendar et al., Applicants

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